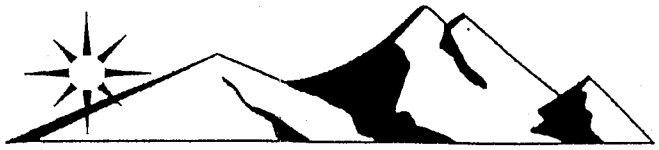

Environmental Consultants

ANIMAS - LA PLATA MITIGATION PROJECT
LA PLATA RIVER CORRIDOR REFERENCE STANDARDS

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1.0 INTRODUCTION

1.1 Background

In 2000, the Bureau of Reclamation completed the Final Supplement (Supplement) to the 1979 environmental impact statement and Record of Decision that addressed impacts associated with the construction and operation of the Animas-La Plata Project (Project). The Project would settle Ute Indian water rights claims and provide municipal and industrial water to several communities within the San Juan Basin as well. In its Supplement, Reclamation identifies numerous mitigating measures to minimize project-related impacts. The proposed Project would store as much as 120,000 AF of water in an off-stream reservoir within an area identified as Ridges Basin. Once filled, this reservoir would inundate approximately 121 acres of riparian-wetland habitat. Construction and operation of the reservoir would destroy 13 acres of riparian-wetland habitat downstream of the dam along Basin Creek.

Reclamation committed to off-setting these impacts by creating, enhancing and or restoring up to 200 acres of riparian-wetland habitats along the La Plata River. The area identified in the Supplement which Reclamation would first seek to obtain riparian-wetland mitigation credits is an approximately 7.5 mile segment of the La Plata River between the confluence of Cherry Creek to a point about one-half mile downstream of the confluence with Long Hollow (Figure 1). Reclamation would use existing flow in the stream augmented by acquired water, associated with the purchase of the Huntington property to restore, enhance and/or create riparian-wetland habitats along the river corridor. Reclamation's goal is to obtain at least 200 acres of riparian-wetland credits within this section of river.

1.2 Purpose and Objectives

In order to determine the amount of mitigation credits that can be acquired within the designated river corridor, baseline reference standards must be established to characterize the condition of existing habitats. The purpose of defining pre-mitigation baseline conditions is to establish a reference point in time that will be used to measure future improvements in both the acreage and condition of riparian-wetland habitats for the purposes of determining mitigation credits. The reference point in time for defining the pre-mitigation baseline shall be 1993.

The objective of this study was to define reference standards indicative of the conditions for high functioning, medium functioning, and low functioning riparian-wetland habitats that occur along the river corridor. Once defined, these standards will be used to reclassify and map the vegetation mapping for the project area based on 1993 conditions. The revised mapping will be used as the pre-mitigation baseline and will be the basis for determining mitigation measures that will result in the restoration, enhancement and/or creation of riparian-wetland habitats to their highest functioning condition.

Figure 1. Project Area Location Map

2.0 METHODS

An on-site investigation of the La Plata River corridor was completed by FRONTIER and Reclamation biologists in July 2001. Four main riparian-wetland habitat types were identified along the corridor, riverine, emergent marsh, riparian forest/scrub-shrub and riparian meadow. Because very few areas of emergent marsh occur within the project area, and because the existing marshes tend to be in a high functioning condition, riparian forest/scrub-shrub and riparian meadow were selected for the formulation of reference standards for future comparative use within the La Plata River corridor.

Parameters were identified and sampled separately for the riparian forest/scrub-shrub and riparian meadow habitat types to establish reference standards for vegetation, hydrology and soils. For each habitat type, three reference sites were selected to represent standards for high, medium and low functional categories. A total of nine reference standard sites were selected for riparian forest/scrub-shrub and a total of nine reference standard sites were selected for riparian meadow habitat types. Thus, a total of 18 reference standard sites were sampled for comparative use within the La Plata River corridor (Table 1). Locations of the reference standard sites were surveyed with a hand-held GPS and will be identified on the 1993 baseline mapping.

Table 1. Reference Standard Sites.

Reference Standard Sites	Habitat Type	Functional Condition
3 Sites: (FH-1), (FH-2), (FH-3)	forest/scrub-shrub	high
3 Sites: (FM-1), (FM-2), (FM-3)	forest/scrub-shrub	medium
3 Sites: (FL-1), (FL-2), (FL-3)	forest/scrub-shrub	low
3 Sites: (MH-1), (MH-2), (MH-3)	riparian meadow	high
3 Sites: (MM-2), (MM-2), (MM-3)	riparian meadow	high
3 Sites: (ML-1), (ML-2), (ML-3)	riparian meadow	high

2.1 Riparian Forest/Scrub-Shrub

Initial reference sites were selected based on general observations of vegetation, soils and hydrology at the site. An approximate 40-meter long transect was established near the center of each riparian forest/scrub-shrub reference site. Along each transect three reference points were then identified. At each reference point vegetation measurements were taken within a 3-meter square vegetation plot. Vegetation measurements include, type of canopy strata present, live stem density of woody plant species, ocular estimates of percent of desirable plant species and percent of undesirable plant species. At reference points one and three, a soil pit was dug to a depth of approximately 18 inches, conditions permitting. Soil horizonation, mottle abundance/contrast, root zone oxidation, soil moisture and soil texture were recorded

for each pit. General descriptions of the plant community, hydrology and prior land use were also noted.

Raw data that was collected for each riparian forest/scrub-shrub reference standard site is given in Appendix A. Basic statistical analyses for the vegetation data is also included in Appendix A. In addition, photos taken at each reference site for future comparative purposes as well as to help the reader better visualize the project area are included in Appendix A.

2.2 Riparian Meadow

Riparian Meadow reference sites were selected based on general observations of vegetation, soils and hydrology observed at the site. A 40-meter transect was established near the center of each riparian meadow. Five reference points were then established along each transect line (one every 10 meters). A 1-meter square vegetation plot was used at each reference point for the collection of vegetative data. Four random measurements of the tallest desirable plant species present were taken in the four quadrants of the vegetation plot. Vegetation measurements also include: type of strata present, ocular estimates of percent total plant cover, percent desirable plant species, percent undesirable plant species and four measurements of vegetation height of desirable plant species. At reference points one, three and five a soil pit was dug to a depth of approximately 18 inches where allowable. Soil horizonation, mottle abundance/contrast, root zone oxidation, soil moisture and soil texture were recorded. General descriptions of the plant community, hydrology and prior land use were also noted.

Raw data that was collected for each riparian meadow reference standard site is given in Appendix B. Basic statistical analyses for the vegetation data is also included in Appendix B. In addition, photos taken at each reference site for future comparative purposes as well as to help the reader better visualize the project area are included in Appendix B.

3.0 RESULTS

3.1 Riparian Forest/Scrub-Shrub

A cumulative list of common plant species that were observed within the riparian forest/scrub-shrub reference sites is shown in Table 2. The status whether these species are desirable or non-desirable was determined based on the listings provide in *Troublesome Weeds of the Rocky Mountain West.*

3.1.1 Low Functional Condition

Areas identified in low functional condition were typically located in places that had been altered by earthmoving disturbances associated with channel straightening and floodplain modification. These areas typically lack vegetative cover in the herbaceous and tree layers with sparse amount of cover in the shrub layer. The live stem density of woody plant species ranged from 0 to 34 stems per $3m^2$ with an average

value of 8.4 stems per vegetation plot. The presence of desirable species ranged from 3 to 50 percent and the plant community in all layers is usually dominated by undesirable species. Common shrub species observed include: Tamarisk (*Tamarix ramosissima*), Sagebrush (*Artmisia sp.*), Rabbitbrush (*Chrysothamnus sp.*), Russian Olive (*Elaeagnus angustifolia*) and Willow (*Salix spp.*) and Narrowleaf Cottonwood (*Populus Augusifolia*). Common herb and grass species include: Curly Cup Gumweed (*Grindelia squarrosa*), Pepperweed (*Lepidium perfoliatum*), Brome grass (*Bromus spp.*), Knapweed (*Centaurea sp.*), Leafy Spurge (*Euphorbia esula*), also occur.

Table 2. Common Plant Species Observed at Riparian Forest/Scrub-Shrub Reference Sites.

Common Name	Scientific Name	Desirable or Non-Desirable
Agrostis spp.	*Agrostis spp.*	Desirable
Brome grass	*Bromus spp.*	Non-Desirable
Coyote Willow	*Salix Exigua*	Desirable
Curly Cup Gumweed	*Grindelia squarrosa*	Desirable
Fescue	*Festuca sp.*	Desirable
Freemont Cottonwood	*Populus fremontii*	Desirable
Knapweed	*Centaurea sp.*	Non-Desirable
Lanceleaf Cottonwood	*Populus acuminata*	Desirable
Leafy Spurge	*Euphorbia esula*	Non-Desirable
Meadow Horsetail	*Equisetum arvense*	Desirable
Narrowleaf Cottonwood	*Populus angusifolia*	Desirable
Peach-leaf Willow	*Salix amygdaloides*	Desirable
Pepperweed	*Lepidium perfoliatum*	Desirable
Plantain	*Plantago sp.*	Desirable
Rabbit Brush	*Chrysothamnus sp.*	Desirable
Rush spp.	*Juncus spp.*	Desirable
Russian Olive	*Elaeagnus angustifolia*	Non-Desirable
Sagebrush	*Artemisia sp.*	Non-Desirable
Sedge spp.	*Carex spp.*	Desirable
Tamarisk	*Tamarix ramossisima*	Non-Desirable
Yellow Sweet Clover	*Melilotus alba*	Desirable

Soils were very dry and appeared to be well drained. Soils were largely composed of cobble with little overlying silt and sand. The hydrology for these areas appear to be lacking due to channel incisement. Prior land use for these areas was intensive livestock grazing, which also contributed to the low functional condition of these areas.

3.1.2 Medium Functional Condition

Areas identified in medium functional condition typically support a mix of desirable versus undesirable herbs, shrubs and trees. Cover in all three strata is usually present. The live stem density of woody plant species ranged from 23 to 91 stems per $3m^2$ with an average value of 46.7 stems per vegetation plot. The presence of desirable species ranged from 26 to 100 percent. Common shrub include: Coyote Willow (*Salix exigua*), Russian Olive (*Elaeagnus angustifolia*), Fremont Cottonwood (*Populus fremontii*), Lanceleaf Cottonwood (*Populus acuminata*), Peach-leaf Willow (*Salix amygdaloides*), Tamarisk, and Rabbitbrush. Common grass and herbaceous species include: Meadow fescue (*Festuca sp.*), Meadow horsetail (*Equisetum arvense*), Sedge (*Carex spp.*) and Rush (*Juncus spp.*) also occur.

Soil moisture varied from dry to saturated in areas. Typically shallow silt sand and clay soils were found to be overlying cobble deposits, however at one reference site (FM-3) soil pits were dug to a depth of 18 inches and cobble was not observed. Mottling and root zone oxidation was observed in most soil pits indicating that seasonal near-surface groundwater does occur. Prior land use for these areas is livestock grazing.

3.1.3 High Functional Condition

Areas identified in high functional condition were observed to support a diverse growth of desirable shrubs and trees. The live stem density of desirable plant species ranged from 98 to 118 stems per $3m^2$ with an average value of 108.7 stems per vegetation plot. The presence of desirable species ranged from 95 to 100 percent. Dominant plant species observed include: Lanceleaf Cottonwood, Coyote Willow, Peach-leaf Willow and Yellow Sweetclover (*Melilotus alba*). Lesser amounts for Fremont Cottonwood, Tamarisk, Leafy Spurge (*Euphoribia esula*), Plantain (*Plantago sp.*), and Agrostis (*Agrostis sp.*).

Soils were observed to be damp. Typically 12 to 18 inches of silt, sand, loam and clay soils was found to be overlying remnant cobble deposits. Mottling and root zone oxidation was observed indicating that seasonal near-surface groundwater does occur. Prior land use for these areas was light livestock grazing.

3.2 Riparian Meadow

A cumulative list of common plant species that were observed within sampled riparian meadow reference sites and whether these species are desirable or non-desirable according to the Troublesome Weeds of the Rocky Mountain West is listed below in Table 3.

Table 3. Common Plant Species Observed at Riparian Meadow Reference Sites.

Common Name	Scientific Name	Desirable or Non-Desirable
Alfalfa	*Medicago sativa*	Desirable
Brome grass	*Bromus spp.*	Non-Desirable
Bullrush	*Scirpus spp.*	Desirable
Chicory	*Chicorium intyraus*	Non-Desirable
Common Dandelion	*Taraxacum officinale*	Desirable
Curly Cup Gumweed	*Grindelia squarrosa*	Desirable
Dyers Woad	*Isatis tinctoria*	Non-Desirable
Fescue	*Festuca sp.*	Desirable
Foxtail Barley	*Hordeum jubatum*	Desirable
Goosefoot	*Chenopodium sp.*	Desirable
Knapweed	*Centaurea sp.*	Non-Desirable
Knotweed	*Polygonum sp.*	Desirable
Lupine	*Lupinus sp.*	Desirable
Meadow Horsetail	*Equisetum arvense*	Desirable
Pepperweed	*Lepidium perfoliatum*	Desirable
Plantain sp.	*Plantago sp.*	Desirable
Red Clover	*Trifolium repens*	Desirable
Rush spp.	*Juncus spp.*	Desirable
Sedge spp.	*Carex spp.*	Desirable
Thistle	*Cirsium spp.*	Non-Desirable
Yarrow	*Achillea millefolium*	Desirable
Yellow Sweet Clover	*Melilotus alba*	Desirable

3.2.1 Low Functional Condition

Areas identified in low functional condition were observed to support a large amount of undesirable herbs and/or are mostly barren of plant species. Average vegetative cover of desirable species ranged from 24 to 37 percent, with total vegetative cover ranging from 33 to 77 percent. The vegetation height for desirable plant species ranged from 0 to 8 inches with an average value of 1.7 inches. Common plant

species observed include: Knapweed (*Centaurea sp.*), Thistle (*Cirsium sp.*) and Chicory (*Chicorium intymus*). Lesser amounts of Yellow Sweetclover, Pepperweed, Goosefoot (*Chenopodium sp.*), Curly Cup Gumweed, Meadow Horsetail, Brome grass, Alfalfa (*Medicago sativa*), Fescue, Dyers Woad (*Isatis tinctoria*), Yarrow (*Achillea millefolium*), and Plantain were also observed.

Soils were very dry and appeared to be well drained. Soils were largely composed of cobble with little overlying silt and sand. Mottling and root zone oxidation were not observed indicating the lack of seasonal near-surface groundwater. Prior land use for these areas are livestock grazing and right-of-way for a buried natural gas pipeline.

3.2.2 Medium Functional Condition

Areas identified in medium functional condition typically support a mix of desirable versus undesirable herbs. Average vegetative cover of desirable species ranged from 44 to 98 percent, with total vegetative cover ranging from 83 to 85 percent. The measured vegetation height for desirable plant species ranged from 1 to 11 inches with an average value of 4.6 inches. Common plant species observed include: Rush, Fescue, Thistle, Yellow Sweetclover and Common Dandelion (*Taraxacum officinale*). Lesser amounts of Goosefoot, Chicory, Knapweed, Meadow Horsetail, Bullrush (*Scirpus sp.*), Lupine (*Lupinus sp.*) and Dyers Woad were also observed.

Soil moisture varied from very dry to damp in areas. Typically silt, clay and loam was found to be overlying cobble deposits at varying depths. Mottling and root zone oxidation was observed in most soil pits indicating that seasonal near-surface groundwater does occur. Prior land use for these areas is livestock grazing.

3.2.3 High Functional Condition

Areas identified as high functional quality reference sites largely support a mix desirable herbs. Average vegetative cover of desirable species ranged from 96 to 100 percent, with total vegetative cover ranging from 99 to 100 percent. The measured vegetation height for desirable plant species ranged from 4 to 28 inches with an average value of 18.3 inches. Dominant plant species observed include: Rush, Fescue, Bullrush, Horsetail, and Yellow Sweetclover. Lesser amounts of Red Clover (*Trifolium repens*), Sedge, Foxtail Barley (*Hordeum jubatum*), Polygonum, Chicory, Thistle and various wildflowers also occur.

Soils were observed to be damp or saturated. Typically soils were composed of silt clay and silt clay loam. At a depth of greater than 7 inches remnant cobble deposits were observed in 3 soil pits. Mottling and root zone oxidation was present indicating that seasonal near-surface groundwater does occur. Prior land use for these areas was light livestock grazing.

4.0 SUMMARY OF REFERENCE STANDARDS

The reference standards established for the riparian forest/scrub-shrub habitat types, as observed in the La Plata River corridor, are listed below in Table 4.

Table 4. Reference Standards for Riparian Forest/Scrub-Shrub Habitat Type.

	Low Functional Quality	Medium Functional Quality	High Functional Quality
Vegetation			
Average live stem density	≤35	36-60	≥61
Canopy strata present	Lacks tree strata. Shrub and herb strata variable.	Herbaceous, shrub and tree strata present.	Herbaceous, shrub and tree strata present.
Percent Desirable plant species	≤25%	25 - 85%	85 -100%
Soils			
Depth	Shallow soils overlying cobble.	Shallow to deep soils overlying cobble.	Mostly deep soils overlying cobble.
Typical Structure	largely cobble	varies widely	varies widely
Hydrology			
Moisture Content	Very dry sites.	Dry to saturated sites.	Damp to saturated sites.
Mottles and Root Zone Oxidation	Mottles and root zone oxidation are rarely observed.	Mottles and root zone oxidation are sometimes observed.	Mottles and root zone oxidation are commonly observed.

The reference standards for riparian meadow habitat types as observed in the La Plata River corridor are listed below in Table 5.

Table 5. Reference Standards for Riparian Meadow Habitat Type.

	Low Functional Quality	Medium Functional Quality	High Functional Quality
Vegetation			
Vegetation height for desirable plant species (inches)	≤5"	5 - 12"	≥12"
Percent total plant cover	≤50%	50 - 90%	90 - 100%
Percent Desirable plant species	≤40%	40 - 90%	90 - 100%
Soils			
Depth	Typically shallow soils overlying cobble.	Shallow to deep soils overlying cobble.	Mostly deep soils overlying cobble.
Typical Structure	varies widely	varies widely	varies widely
Hydrology			
Moisture Content	Very dry sites.	Dry to sometimes saturated sites.	Damp to sometimes saturated sites.
Mottles and Root Zone Oxidation	Mottles and root zone oxidation are rarely observed.	Mottles and root zone oxidation are commonly observed.	Mottles and root zone oxidation are commonly observed.

APPENDIX A:

Riparian Forest/Scrub-Shrub
(Analysis, Data Sheets, Photos)

Statistical Analysis for Reference Site - Forest Low

Forest Low - Site 1		Forest Low - Site 2		Forest Low - Site 3	
Reference Points	Stem Density (live stems)	Reference Points	Stem Density (live stems)	Reference Points	Stem Density (live stems)
1	0.0	1	0.0	1	0.0
2	0.0	2	10.0	2	32.0
3	0.0	3	34.0	3	0.0
Average Value	0.0		14.7		10.7
Miniumum Value	0.0		0.0		0.0
Maximum Value	0.0		34.0		32.0

Forest Low - Cumulative	
Average Value	8.4
Miniumum Value	0.0
Maximum Value	34.0
Standard Deviation	14.3

Statistical Analysis for Reference Site - Forest Medium

Forest Medium - Site 1		Forest Medium - Site 2		Forest Medium - Site 3	
Reference Points	Stem Density (live stems)	Reference Points	Stem Density (live stems)	Reference Points	Stem Density (live stems)
1	85.0	1	32.0	1	25.0
2	91.0	2	33.0	2	34.0
3	58.0	3	39.0	3	23.0
Average Value	78.0		34.7		27.3
Miniumum Value	58.0		32.0		23.0
Maximum Value	91.0		39.0		34.0

Forest Medium - Cumulative	
Average Value	46.7
Miniumum Value	23.0
Maximum Value	91.0
Standard Deviation	25.5

Statistical Analysis for Reference Site - Forest High

Forest High - Site 1		Forest High - Site 2		Forest High - Site 3	
Reference Points	Stem Density (live stems)	Reference Points	Stem Density (live stems)	Reference Points	Stem Density (live stems)
1	110.0	1	105.0	1	60.0
2	118.0	2	102.0	2	48.0
3	98.0	3	66.0	3	39.0
Average Value	108.7		91.0		49.0
Miniumum Value	98.0		66.0		39.0
Maximum Value	118.0		105.0		60.0

Forest High - Cumulative	
Average Value	82.9
Miniumum Value	39.0
Maximum Value	118.0
Standard Deviation	29.6

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: FL-1			Date: 7/11/01		
River Segment: 1	Reach: 3		Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB		
GPS Coordinates: N37°05'40.5" W108°11'53.2"			Quality:	High	Medium	Low
Photo Number(s): 39, 40, 41, 42						X
Recorders: Dennis Wright, Kate Munson, Mike Preece						

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1				N/A	N/A	0
2				N/A	N/A	0
3				N/A	N/A	0

Remarks: Area is barren. There is no stratum or desirable/undesirable plant species present. Bird species were observed in Reference Point 1.

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-3	A				[illegible]
	3-5	C				[illegible]
Pit 2						
	0-3	A			[illegible]	[illegible]
	3-5	C			[illegible]	[illegible]

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

ABITAT REFERENCE SITE

[illegible]nce Site: FL-2		Date: 7/12/01			
River Segment: 3	Reach: 10	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates: N37°06'27.1" W108°12'14.9"		Quality:	High	Medium	Low
Photo Number(s): 43,44,45					X
Recorders: [illegible] Dick [illegible] Mike Francis					

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X			10	90	0
2		X		0	100	10
3		X		0	100	34
Avg				3.3%		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	20	A				[illegible]
Pit 2						
	20	A				[illegible]

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

IABITAT REFERENCE SITE

[illegible]nce Site: FL-3		Date: 7/12/01			
River Segment: 3	Reach: 10	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates: N37°02'43.6" W108°11'03.5"		Quality:	High	Medium	Low
Photo Number(s): 46 47 48					X
Recorders: Dennis Wenger, Dale Munson, Mike Flores					

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1		X		0	100	0
2		X		100	0	2
3				0	0	0
				50%		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-8	A			dry	Silt loam / cobble
	>8	I				cobble / rock
Pit 2						
	0-8	A			dry	fine Sand / cobble
	>8	I				cobble / rock

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

ABITAT REFERENCE SITE

nce Site: FM-1			Date: 7/11/01			
River Segment: 1	Reach: 2		Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates: N 37°06' 14.8" W 108°12' 09.7"			Quality:	High	Medium	Low
Photo Number(s): 49 50 51					X	
Recorders: Dennis Wenger, Dale Munson, Mike Francis						

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X		100	0	85
2	X	X		100	0	91
3	X	X		100	0	58
				100%		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-4	A	Many / distinct	X	damp	Sand Silt Clay
	4+	B			saturated	cobble
Pit 2						
	0-4	A	many / distinct	X	damp	Sand Silt Clay
	4+	B			saturated	Cobble

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: FM-2		Date: 7/12/01			
River Segment: 3	Reach: 9	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates: N37°03'13.0" W108°10'57.9"		Quality:	High	Medium	Low
Photo Number(s): 52, 53, 54				X	
Recorders: Dennis Wenger Dick Munson Mike Francis					

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X	X	60	40	32
2	X	X	X	40	60	33
3	X	X	X	50	50	35
				50%		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-1	A			Dry	[illegible] Sand
	>1	A				[illegible]/Rock
Pit 2						
	0-2	A			Dry	Silt Loam
	>2	A				Cobble/Rock

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: FM-3		Date: 7/12/01	
River Segment: 3	Reach: 8	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB	
GPS Coordinates: N37°03'18.9" W108°10'59.6"		Quality:	High / Medium / Low
Photo Number(s): 53 56 57			X
Recorders: [illegible]			

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X	X	0	100	25
2	X	X	X	50	50	34
3	X	X	X	30	70	23
				26%		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-3	O		X	[illegible]	Organic / roots
	3-18	A	Few / faint	X	[illegible]	Fine Sandy Loam
					/	
Pit 2						
	0-1	O		Y	[illegible]	Organic / roots
	1-10	A	Few / faint	Y	[illegible]	Fine Sand
	10-18	A	Few / faint	Y	[illegible]	Fine Sand Loam
			/		/	

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

ABITAT REFERENCE SITE

ce Site: FH-1			Date: 7/11/01			
River Segment: 1	Reach: 2		Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates: N 37° 0' 14.3" W108° 12' 09.5"			Quality:	High	Medium	Low
Photo Number(s): 58, 59 60				X		
Recorders: Dennis Hengen, Dale Munson, Mike Francis						

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X	X	100	0	110
2	X	X	X	100	0	118
3	X	X	X	100	0	99
RVE				100		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-2	O		X	damp	Silt Clay, Roots
	2-6	A	many/distinct	X	damp	Silty Clay Loam
	6-18	B	many/distinct		damp	Sand Cobble
Pit 2						
	0-4	A	Many/distinct	X	dry	
	4-16	A	Many/distinct		damp	
	7-16				damp	Layers of Alluvial Cobble

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: FH-2		Date: 7/11/01			
River Segment: 1	Reach: 3	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates: N37°05'57.4" W108°12'08.0"		Quality:	High	Medium	Low
Photo Number(s): 1162			X		
Recorders: Dennis [illegible], Dale [illegible], Mike Francis					

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X	X	100	0	105
2	X	X	X	100	0	102
3	X	X	X	100	0	106
NE				100		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-1	O		X	damp	[illegible] Loam. Organic
	1-15	A	[illegible]	X	damp	Sand loam
	>15	C				Cobble/Rock
Pit 2						
	0-16	A		X	damp	Sand silt loam

Remarks: A & B contains oxidized root pores throughout the soil column.

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

ABITAT REFERENCE SITE

Reference Site:	FH-3		Date:	7/11/01		
River Segment:	1	Reach: 1	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB			
GPS Coordinates:	N37°06'27.1" W108°12'14.8"		Quality:	High	Medium	Low
Photo Number(s):	63, 64, 65			X		
Recorders:	Dennis Wagner, Dale Munson, Mike Francis					

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X	X	100	0	100
2	X	X	X	90	10	48
3	X	X	X	90	10	29
AVG				95%		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-12	A	distinct/many	X	damp	silt sand
	12+	B				cobbl/LOR
Pit 2						
	0-14	A	distinct/many	X	damp	silt sand
	14+	B				cobbl/LOR

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

[Refere]nce Site: FH-2		Date: 7/11/01	
River Segment: 1	Reach: 3	Habitat Type: RIPARIAN FOREST / SCRUB-SHRUB	
GPS Coordinates: N37°05'57.4" W108°12'08.0"		Quality:	High / Medium / Low
Photo Number(s): 1162			High: X
Recorders: Dennis [illegible], Dale [illegible], Mike Francis			

VEGETATION

Reference Point	Stratum Present			% Desirable Plant Species	% Undesirable Plant Species	Live Stem Density (desirable species)
	Herb	Shrub	Tree			
1	X	X	X	100	0	105
2	X	X	X	100	0	102
3	X	X	X	100	0	66
AVE				100		

Remarks:

SOILS

Soil Profile Descriptions (2 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-1	O		X	damp	[illegible] loam, Organic
	1-15	A	[illegible]	X	damp	Sand loam
	715	B				Cobble/Rock
Pit 2						
	0-16	A		X	damp	Sand silt loam

Remarks: A & B contain Oxidized root zones throughout the soil column.

Statistical Analysis for Reference Site - Meadow Low

Meadow Low - Site 1		Meadow Low - Site 2		Meadow Low - Site 3	
Reference Points	Veg. Height (inches)	Reference Points	Veg. Height (inches)	Reference Points	Veg. Height (inches)
1	8.0	1	0.0	1	1.0
	0.0		1.0		2.0
	8.0		3.0		0.0
	0.0		0.0		2.0
2	1.0	2	0.0	2	0.0
	0.0		2.0		0.0
	3.0		1.0		0.0
	1.0		0.0		2.0
3	3.0	3	2.0	3	1.0
	2.0		3.0		0.0
	2.0		3.0		1.0
	4.0		1.0		3.0
4	3.0	4	2.0	4	3.0
	2.0		1.0		0.0
	7.0		3.0		1.0
	4.0		1.0		1.0
5	2.0	5	2.0	5	2.0
	0.0		0.0		2.0
	3.0		2.0		0.0
	0.0		1.0		1.0
Average Value	2.7		1.4		1.1
Miniumum Value	0.0		0.0		0.0
Maximum Value	8.0		3.0		3.0

Meadow Low - Cumulative

Average Value	1.7
Miniumum Value	0.0
Maximum Value	8.0
Standard Deviation	1.8

Statistical Analysis for Reference Site - Meadow Medium

Meadow Medium - Site 1		Meadow Medium - Site 2		Meadow Medium - Site 3	
Reference Points	Veg. Height (inches)	Reference Points	Veg. Height (inches)	Reference Points	Veg. Height (inches)
1	3.0	1	4.0	1	7.0
	3.0		3.0		5.0
	3.0		7.0		6.0
	6.0		2.0		8.0
2	4.0	2	4.0	2	6.0
	3.0		4.0		6.0
	3.0		1.0		9.0
	2.0		2.0		7.0
3	3.0	3	3.0	3	8.0
	6.0		1.0		4.0
	3.0		2.0		4.0
	4.0		3.0		7.0
4	3.0	4	4.0	4	3.0
	4.0		1.0		8.0
	1.0		3.0		11.0
	6.0		3.0		6.0
5	6.0	5	5.0	5	5.0
	4.0		4.0		5.0
	7.0		4.0		10.0
	3.0		3.0		9.0
Average Value	3.9		3.2		6.7
Miniumum Value	1.0		1.0		3.0
Maximum Value	7.0		7.0		11.0

Meadow Medium - Cumulative

Average Value	4.6
Miniumum Value	1.0
Maximum Value	11.0
Standard Deviation	2.3

Statistical Analysis for Reference Site - Meadow High

Meadow High - Site 1		Meadow High - Site 2		Meadow High - Site 3	
Reference Points	Veg. Height (inches)	Reference Points	Veg. Height (inches)	Reference Points	Veg. Height (inches)
1	24.0	*1*	11.0	*1*	15.0
	24.0		24.0		13.0
	22.0		18.0		10.0
	16.0		21.0		12.0
2	21.0	*2*	20.0	*2*	15.0
	18.0		24.0		19.0
	28.0		20.0		15.0
	20.0		21.0		20.0
3	21.0	*3*	20.0	*3*	16.0
	26.0		24.0		16.0
	27.0		18.0		13.0
	20.0		23.0		15.0
4	27.0	*4*	18.0	*4*	14.0
	24.0		16.0		4.0
	19.0		13.0		16.0
	25.0		14.0		11.0
5	17.0	*5*	19.0	*5*	16.0
	12.0		22.0		23.0
	13.0		14.0		17.0
	14.0		20.0		18.0
Average Value	20.9		19.0		14.9
Miniumum Value	12.0		11.0		4.0
Maximum Value	28.0		24.0		23.0

Meadow High - Cumulative

Average Value	18.3
Miniumum Value	4.0
Maximum Value	28.0
Standard Deviation	4.9

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: ML-1			Date: 7/11/01		
Segment: 1	Reach: 2		Habitat Type: RIPARIAN-MEADOW		
GPS Coordinates: N37°06'18.7" W108°12'07.7"			Quality:	High	Medium	Low
Photo Number(s): 1,2,3,4						X
Recorders: Dennis Jones, Deke Munson, Mike Francis						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	55	5	95	8	0	8	0
2	80	40	60	1	0	3	1
3	80	15	85	3	2	2	4
4	80	50	50	3	2	7	4
5	90	10	90	2	0	2	0
AVE.	77%	24%					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-3	O			Dry	Silt Clay Loam, Roots
	3-3	A			Dry	Cobble, 10YR
Pit 2						
	0-2	O			Dry	Organic Material, Roots
	2-14	A			Dry	Silty Clay Loam
	14-18	R			Dry	Silt Loam
Pit 3						
	0-2	O			Dry	Organic material
	2-18	A			Dry	Silt Loam

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: ML-2			Date: 7/12/01		
Segment: 1	Reach: 3		Habitat Type: RIPARIAN-MEADOW		
GPS Coordinates: N37°03'10.8" W108°11'00.3"			Quality:	High	Medium	Low
Photo Number(s): 5, 6, 7, 8						X
Recorders: Dennis L. Kroger, Dale Munson, Mike Francis						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	15	10	90	0	1	3	0
2	15	10	90	0	2	1	0
3	40	50	50	2	3	3	1
4	50	40	60	2	1	3	1
5	40	50	50	2	0	2	1
AVE	33%	32%					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	Cobble	Bar/	Disturbed			
Pit 2						
	Cobble	Bar/	Disturbed			
Pit 3						
	Cobble	Bar/	Disturbed			

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: ML-3			Date: 7/12/01		
Segment: 3	Reach: 8		Habitat Type: RIPARIAN-MEADOW		
GPS Coordinates: N37°03'13.1" W108°10'58.1"			Quality:	High	Medium	Low
Photo Number(s): 9, 10, 11, 12						X
Recorders: Dennis Wenger, Dale Munson, Mike Francis						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	40	50	50	1	2	0	2
2	25	50	50	0	0	0	2
3	25	40	60	1	0	1	3
4	75	25	75	3	0	1	1
5	80	20	80	2	2	0	1
	49%	37%					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-1	O			dry	Organic/Roots/Silt Loam
	1-8	A			dry	Silt Loam
	>8	B			moist	Cobble/LOR
Pit 2						
	0-11	A			dry	Silt Sand Loam
	>11	B			moist	Cobble/LOR
Pit 3						
	0-16	A	Faint/distinct (16")		dry	Silt Loam
					moist	

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: MM-1			Date: 7/11/01		
Segment: 1	Reach: 2		Habitat Type: RIPARIAN-MEADOW		
GPS Coordinates: N37°06'16.4" W108°12'06.9"			Quality:	High	Medium	Low
Photo Number(s): 13, 14, 15, 16					X	
Recorders: Dennis Hengen, Dale Munson, Mike Francis						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	80	99	1	3	3	3	6
2	90	99	1	4	3	3	2
3	95	99	1	7	6	3	4
4	80	99	1	3	4	1	6
5	70	95	5	6	4	7	3
AVG	83%	98%					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-3	O			dry	Silt loam, Roots
	3	A			dry	Cobbly/LOR
Pit 2						
	0-3	O			dry	Silt loam Roots
	>3	A			dry	Cobbly/LOR
Pit 3						
	0-3	O			dry	Silt loam Roots
	3-18	A			dry	Cobbly/LOR

Remarks: Soils all very dry.

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site:	MM - 2		Date:	7/11/01		
Segment:	1	Reach: 3	Habitat Type: RIPARIAN-MEADOW			
GPS Coordinates:	N37°05'53.9" W108°12'03.1"		Quality:	High	Medium	Low
Photo Number(s):	17, 18, 19, 20				X	
Recorders:	Dennis Wangeli, Dale Muncon, Mike Francis.					

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	90	80	20	4	3	7	2
2	80	75	25	4	4	1	2
3	90	90	10	3	1	2	3
4	80	85	15	4	1	3	3
5	85	80	20	5	4	4	3
	85%	81%					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-3	O		X	damp	Silt Loam / Organic
	3-12	A	Many/distinct	X	damp	Silt Clay
	12 -	B				Cobble/LOP
Pit 2						
	0-2	O		X	damp	Silt Clay Loam/Organic/Roots
	2-6	A		X	damp	Silt Clay Loam
	6-17	B	Many/distinct	X	damp	Silt Clay
	17-18	B	Many/distinct	X	damp	Clay
Pit 3						
	0-3	O		X	damp	Silt Clay Loam/Organic/Roots
	3-12	A	Many/distinct	X	damp	Silt Clay
	12-18	B	Many/distinct	X	damp/saturated	Silt Clay

Remarks: Pit 3: Saturation occurs at ~ 16inches depth.

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: MM-3			Date: 7/12/01			
Segment: 3	Reach: 8		Habitat Type: RIPARIAN-MEADOW			
GPS Coordinates: N37°03'13.6" W108°11'00.3"			Quality:	High	Medium	Low
Photo Number(s): 21, 22, 23, 24					X	
Recorders: Dennis Hansen, Dale Munson, Mike Francis						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	95	70	30	7	5	6	8
2	80	50	50	6	6	9	7
3	80	40	60	8	4	4	7
4	90	10	90	5	8	11	6
5	80	50	50	5	5	10	9
	95%	44%					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-1	O		X	damp	organic/loam
	1-4	A	many/distinct	X	damp	Sand
	4-18	B	many/distinct	X	damp	Silty Sand
Pit 2						
	0-2	O		X	dry	organic/loam
	2-9	A	many/distinct	X	dry	Silt Loam
	9	B				Cobble/LOR
Pit 3						
	0-1	O		X	damp	organic/loam
	1-4	A	many/distinct	X	damp	Silt Clay Loam
	4-18	B	many/distinct	X	damp	Silty Sand

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: MH-1			Date: 7/11/01			
Segment: 1	Reach: 2		Habitat Type: RIPARIAN-MEADOW			
GPS Coordinates: N 37° 06' 20.3" W108° 12' 09.2"			Quality:	High	Medium	Low
Photo Number(s): 25, 26, 27, 28				X		
Recorders: Dennis Wenger, Dale Munson, Mike Francis						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	100	100	0	24	24	22	16
2	100	100	0	21	18	28	20
3	100	99	1	21	26	27	20
4	100	100	0	27	24	19	25
5	100	100	0	17	12	13	14
Extra	100	100	0	26	20	24	18
Avg.	100	100					

Remarks: Reference points were taken at 10 Meter intervals along a transect.

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-12	A	many/distinct		damp	Silt Clay Loam
	12-18	B	many/distinct		damp	Silt Loam
Pit 2						
	0-9	A	few/slight		damp	Silt Clay Loam
	9-18	B	distinct/many		damp	Silt Loam
Pit 3						
	0-6	A	distinct/many	X	damp	Silt Clay Loam
	6-9	B	distinct/many	X	damp	Silt Clay Loam
	9+	B	distinct/many		damp	LOR/Cobble

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: MH-2		Date: 7/11/01			
Segment: 1	Reach: 2	Habitat Type: RIPARIAN-MEADOW			
GPS Coordinates: N37°N.'N??" 1.) 108°12'10.8"		Quality:	High	Medium	Low
Photo Number(s): 29 30, 31, 32				X	
Recorders: Dennis Wenger, Dale Munson, Mike Francis					

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	100	99	1	11	24	18	21
2	98	100	0	20	24	20	21
3	99	100	0	20	24	18	23
4	100	100	0	18	16	13	14
5	99	100	0	19	22	14	20
AVE	99	99					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-6	A		X	damp	Silt Clay Loam
	6-18	B	many/distinct	X	damp	Silt Loam/Sandy [illegible]
Pit 2						
	0-1	O		X	damp	Silt Clay loam/organic
	1-6	A		X	damp	Silt Clay loam
	6-10	A	many/distinct	X	damp	Silty Sand
	>10	B				Cobble/LOR
Pit 3						
	0-1	O			damp	Loam/Roots
	1-7	A			saturated @ 4"	Silty loam/Roots
	>7	B				Cobble/LOR

Remarks:

ANIMAS-LA PLATA WATER DEVELOPMENT PROJECT
LA PLATA RIVER RIPARIAN-WETLAND MITIGATION

HABITAT REFERENCE SITE

Reference Site: MH-3			Date: 7/11/01		
Segment: 1	Reach: 2		Habitat Type: RIPARIAN-MEADOW		
GPS Coordinates: N37°06'05.2" W108°12'16.1"			Quality:	High	Medium	Low
Photo Number(s): 33, 34, 35, 36, 37, 38				X		
Recorders: Dennis Wenger, Nate Munson, Mike Francis.						

VEGETATION

Reference Point	% Total Plant Cover	% Desirable Plant Species	% Undesirable Plant Species	Vegetation Height (inches) (desirable species)			
				1	2	3	4
1	99	99	1	15	13	10	12
2	100	100	0	15	19	15	20
3	100	95	5	16	16	13	15
4	95	95	5	14	4	16	11
5	100	90	10	16	25	17	18
AVE	99	96					

Remarks:

Soil Profile Descriptions (3 Soil Pits)

	Depth (inches)	Horizon	Mottle Abundance/Contrast	Oxidized Root Channels	Soil Moisture	Texture, Concretions, Structure, etc.
Pit 1						
	0-4	A		X	damp	Silt Clay / Rooty
	4-18	B	many / distinct (>1/4")	X	damp	Silt Clay
Pit 2						
	0-4	A		X	damp	Silt Clay Loam / Rooty
	4-18	B	many / distinct (<1/4")	X	damp	Silt Loam
Pit 3						
	0-18	A	many / distinct (>6")	X	damp	Silt Clay

Remarks:

Mitigation Monitoring Data Sheets

HABITAT REFERENCE SITE

Reference Site:		Date:			
River Segment:	Reach:	Habitat Type:			
GPS Coordinates:		Quality:	High	Medium	Low
Photo Number(s):					
Recorders:					

[illegible]	[illegible]		[illegible]		[illegible]
Percent Total Plant Cover	≤50%		50%-90%		≥90%
Average live stem density	≤35		36-60		≥61
Canopy strata present	Lacks tree and shrub strata. Herbaceous strata variable.		Herbaceous and shrub strata present. Tree strata variable.		Herbaceous, shrub and tree strata present.
Percent Desirable plant species	≤25%		25 - 85%		≥85
Grazing	Heavy		Moderate		Negligible
[illegible]					
Percent Total Plant Cover	≤50%		50%-90%		≥90%
Vegetation height	≤5"		5 - 12"		≥12"
Percent Desirable plant species	≤25%		25 - 85%		≥85
Grazing	Heavy		Moderate		Negligible
[illegible]					